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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/967,206	09/28/2001	Karvel K. Thornber	14919	7905
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EXAMINER

STREGE, JOHN B

ART UNIT

PAPER NUMBER

2625

DATE MAILED: 07/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/967,206

Applicant(s)

THORNER ET AL

Examiner

John B. Strege

Art Unit

2625

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 February 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 9-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 3 and 4 is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Response to Amendment

1. The amendment filed 2/18/05 has been entered in full. Currently claims 1-4, and 9-15 are pending in the application. The objection to the lack of drawings has been withdrawn.

Applicant's arguments with respect to claims 1-4 have been considered but are moot in view of the new ground(s) of rejection.

Double Patenting

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claim 1 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 6 of U.S. Patent No. 6,900,805. Although the conflicting claims are not identical, they are not patentably distinct from each other because claim 6 of Patent # 6,900,805 is a narrower claim than the claim 1 of the instant application. Claim 6 contains all of the limitations of claim 1 except for the obvious difference that in claim 6 the rendered images include both diffusely and off-

specularly reflected light whereas in claim 1 of the instant application the rendered images include both diffusely and specularly reflected light. As the diffuse light is present it is inherent that there would be some off-specular light present as well.

4. Claims 9-13 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-5 of U.S. Patent No. 6,853,745 in view of Zhang et al. USPN 6,639,594 (hereinafter "Zhang"). Although the conflicting claims are not identical, they are not patentably distinct from each other because claim 1 of Patent # 6,853,745 contains narrower limitations than those of claim 9 of the instant application. Claim 9 of the instant application also claims the additional obvious feature of approximating the specular and scattering reflectance (line6) as opposed to claim 1 of patent # 6,853,745. Zhang discloses the obvious added limitation of depicting the diffuse and the specular reflection and estimating the reflectance parameters of the object surface (as seen in figure 2). Claims 2-5 of patent # 6,853,745 and claims 10-13 of the instant application are identical.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chang et al. USPN 6,137,896 (hereinafter "Chang") in view of Boivin et al. *Image-Based*

Rendering of Diffuse, Specular and Glossy Surfaces from a Single Image (hereinafter "Boivin").

Regarding claim 1, Chang discloses a method of recognizing objects under various lighting conditions (column 4, lines 46-57); the method comprising the steps of: (a) providing a database of the plurality of three-dimensional (rendered images determined from a range image) models (column 6, lines 46-51; column 10, lines 4-9); (b) providing an input image (column 7, line 49-51); (c) positioning (orienting) each three dimensional model (reference range image) relative to the input image (col. 9 lines 10-14); (d) for each three-dimensional model, determining a rendered image that is most similar to the input image (col. 9, lines 21-35); (e) computing a measure of similarity (correlation value) between the input image and each rendered image (col. 4, lines 46-55); and (f) selecting the three-dimensional model (reference images) corresponding to the rendered image whose measure of similarity is most similar to the input image (col. 9, lines 26-35).

Chang discloses that correlation results between images are substantially illumination independent (col. 2, lines 53-54; col. 5, lines 41-61), but does not disclose a step of deriving a reflectance function that describes an approximation of the set of all possible rendered images that each three dimensional model can produce under all possible lighting conditions, said rendered images including both diffusely and specularly reflected light; and optimizing the reflectance function to determine rendered image of each model that is most similar to the input image. Boivin discloses image based rendering of diffuse, specular and glossy surfaces from a single image to obtain a

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complete description of the photometric properties of the scene which may be used to produce a photorealistic synthetic image very similar to the real one (first paragraph of section 8, page 115). Boivin further discloses optimizing the reflectance function to determine rendered image of each model that is most similar to the input image (section 6, page 114, and first paragraph of section 8).

At the time of the invention it would have been obvious to one of ordinary skill in the art to determined a rendered image in the invention of Chang by deriving a reflectance function that describes an approximation of the set of all possible rendered images that the three-dimensional model can produce under all possible lighting conditions, including both diffusely and specularly reflected light, and optimize the reflectance function to determine the image of each model that is most similar to the input image as taught by Boivin. The motivation for doing so would be to take into account specular surfaces in the illumination thus allowing for better recognition (second paragraph of section 1.1). Thus it would have been obvious at the time of the invention to one of ordinary skill in the art to combine Chang and Boivin to obtain the invention as specified in claim 1.

Regarding claim 2, Boivin discloses in section 4.3 that the reflectance function employs a model of specular reflectance that accounts for the angle between the direction of observation and the direction of perfect specular reflectance.

Allowable Subject Matter

7. Claims 3-4 are allowed.

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8. The following is a statement of reasons for the indication of allowable subject matter: Claims 3-4 were allowed in the previous office action.

9. Claims 9-15 would be allowable if the double patenting rejection of claims 9-13 is overcome.


Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John B. Strege whose telephone number is (571) 272-7457. The examiner can normally be reached on Monday-Friday between the hours of 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on (571) 272-7453. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JS


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